

WHAT IS CLAIMED IS:

1. A method for noiselessly switching audio provided on an egress audio channel over a network, comprising:

- (a) generating a first audio stream of egress packets for the egress audio channel, wherein each egress packet includes a payload carrying audio and control header information;
- (b) switching and delivering said first audio stream to a first network interface controller associated with the egress audio channel;
- (c) generating a second audio stream of egress packets, wherein each egress packet includes a payload carrying audio and control header information;
- (d) switching and delivering said second audio stream to the first network interface controller associated with the egress audio channel; and
- (e) evaluating the relative priority of the first and second audio streams based on priority information in the control header information of the egress packets to determine which of the first and second audio streams is a higher priority audio stream to transmit on the egress audio channel over the network.

2. The method of claim 1, further comprising:

- packetizing the higher priority audio stream to create an output egress audio stream of packets with synchronized header information; and
- transmitting the output egress audio stream of packets on the egress audio channel over the network.

3. The method of claim 1, further comprising:

- packetizing the lower priority audio stream to create an output egress audio stream of packets with synchronized header information, whereby, synchronized header information is noiselessly preserved in IP packets transmitted

on the egress audio channel over the network for audio from both of the first and second audio streams.

4. The method of claim 1, further comprising:

converting the first audio stream of egress packets into first cells; and

converting the second audio stream of egress packets into second cells;

wherein said switching step (b) comprises switching the converted first cells to a SVC associated with the egress audio channel, and said switching step (d) comprises switching the converted second cells to the SVC associated with the egress audio channel.

5. The method of claim 2, wherein said synchronized header information comprises valid RTP information.

6. The method of claim 1, further comprising:

(f) determining synchronized RTP header information for each of the first and second audio streams prior to transmitting IP packets containing audio payloads of the respective first and second audio streams on the egress audio channel over the network.

7. A method for noiselessly switching audio from a second audio source to an egress audio channel already carrying audio from a first audio source, comprising:

generating an audio stream of egress packets at the second audio source;

converting the audio stream of egress packets into cells;

switching the converted cells to a switched virtual circuit (SVC) associated with the egress audio channel;

converting the switched cells back to the audio stream of egress packets;

packetizing the audio stream to create an output egress audio stream of packets with synchronized header information; and

transmitting the output egress audio stream of packets on the egress audio channel over a network in place of the audio from the first audio source.

8. The method of claim 7, wherein said generating step generates an audio stream of egress packets at the second audio source in response to a call event.

9. The method of claim 7, wherein said generating step generates an audio stream of egress packets at the second audio source in response to a call event, the audio stream of egress packets including a type of audio selected from at least one of voice, music, tones, or sound.

10. The method of claim 9, further comprising generating the call event based on at least one of the following conditions: an emergency condition, a call signaling condition, a call event based on callee or caller information, or a request for audio information.

11. The method of claim 9, further comprising generating the call event based on a request for audio information, wherein the request for audio information includes at least one of a request for advertisements, news, sports, financial, music or other audio content.

12. A method for introducing noiseless switch over audio for voice over the Internet (VOIP) telephone calls, comprising:

establishing a VOIP telephone call between a destination device and a media server;

setting priority information for a first audio source;

delivering a first audio stream of egress packets that includes the set priority information;

determining a call status with respect to availability of receiving noiseless switch over audio; and

processing a call event that includes noiseless switch over audio when the call status determining step indicates the established VOIP telephone call is a candidate for receiving noiseless switch over audio.

13. The method of claim 12, wherein said processing step includes:  
determining priority information for the noiseless switch over audio; and  
transmitting the noiseless switch over audio in an output audio stream of packets in the established VOIP telephone call when the determined priority information for the noiseless switch over audio is greater than the set priority information of the first audio stream.

14. The method of claim 13, further comprising:  
generating a second audio stream of egress packets at a second audio source, the audio stream having the noiseless switch over audio in payloads;  
converting the second audio stream of egress packets into cells;  
switching the converted cells to a SVC associated with an egress audio channel of the established VOIP telephone call;  
converting the switched cells back to the second audio stream of egress packets;  
packetizing the second audio stream with synchronized header information to create the output audio stream of packets in the established VOIP telephone call; and  
transmitting the output audio stream of packets on the egress audio channel in the established VOIP telephone call over a network in place of the audio from the first audio source.

15. A system for noiselessly switching audio provided on an egress audio channel over a network, comprising:

first and second audio sources;

a switch coupled to said first and second audio sources; and

a network interface controller coupled to said switch, wherein

said first audio source generates a first audio stream of egress packets for the egress audio channel, wherein each egress packet includes a payload carrying audio and control header information,

said second audio source generates a second audio stream of egress packets, wherein each egress packet includes a payload carrying audio and control header information, and said switch switches and delivers said first and second audio streams to said network interface controller.

16. The system of claim 15, further comprising:

an egress audio controller coupled to said second audio source, wherein said egress audio controller sends a control signal to said second audio source to initiate the generation of said second audio stream.

17. The system of claim 16, wherein said egress audio controller is further coupled to said first audio source, said switch, and said network interface controller, and wherein said egress audio controller sends a control signal to said first audio source to initiate the generation of said first audio stream when a VOIP telephone call is established, sends a control signal to said switch identifying said network interface controller as being associated with an egress audio output channel associated with the established VOIP telephone call, and sends a control signal to said network interface controller as being associated with an egress audio output channel associated with the established VOIP telephone call.

18. The system of claim 16, wherein said egress audio controller is further coupled to said first audio source, and wherein said egress audio controller sends control signals to said first and second audio sources to set priority information in said first and second audio streams.

19. The system of claim 15, further comprising at least one packet processor that generates IP packets having synchronized header information and audio payloads, the audio payloads including audio payloads carried in said first and second audio streams.

20. The system of claim 19, wherein said network interface controller dynamically selects which of the IP packets to transmit based on the relative priority of the first and second audio streams; and wherein said switch comprises a packet switch or a cell switch.

21. The system of claim 15, wherein at least one of said first audio source and said second audio source internally generates the audio for said respective first and second audio streams.

22. The system of claim 15, wherein at least one of said first audio source and said second audio source converts audio from an external source to generate the audio for said respective first and second audio streams.

23. A system for noiselessly switching audio from a second audio source to an egress audio channel already carrying audio from a first audio source, comprising:

means for generating an audio stream of egress packets at the second audio source;

means for converting the audio stream of egress packets into cells;

means for switching the converted cells to a SVC associated with the egress audio channel;

means for converting the switched cells back to the audio stream of egress packets;

means for packetizing the audio stream to create an output egress audio stream of packets; and

means for transmitting the output egress audio stream of packets on the egress audio channel over a network in place of the audio from the first audio source.

24. A system for introducing noiseless switch over audio for voice over the Internet (VOIP) telephone calls, comprising:

means for establishing a VOIP telephone call between a destination device and a media server;

means for setting priority information for a first audio source;

means for delivering a first audio stream of egress packets that includes the set priority information;

means for determining a call status with respect to availability of receiving noiseless switch over audio; and

means for processing a call event that includes noiseless switch over audio when the call status determining step indicates the established VOIP telephone call is a candidate for receiving noiseless switch over audio.

25. The system of claim 24, wherein said processing means includes:

means for determining priority information for the noiseless switch over audio; and means for transmitting the noiseless switch over audio in an output audio stream of packets having synchronized header information in the established VOIP telephone call when the determined priority information for the switch over audio is greater than the set priority information of the first audio stream.

26. The system of claim 25, further comprising:

means for generating a second audio stream of egress packets at a second audio source, the audio stream having the noiseless switch over audio in payloads;

means for converting the second audio stream of egress packets into cells;

means for switching the converted cells to a SVC associated with an egress audio channel of the established VOIP telephone call;

means for converting the switched cells back to the second audio stream of egress packets;

means for packetizing the second audio stream to create the output audio stream of packets in the established VOIP telephone call; and

means for transmitting the output audio stream of packets on the egress audio channel in the established VOIP telephone call over a network in place of the audio from the first audio source.

27. A method for introducing noiseless switch over audio for voice over the Internet (VOIP) telephone calls, comprising:

establishing a VOIP telephone call; and

transmitting noiseless switch over audio in an output audio stream of packets with synchronized header information in the established VOIP telephone call.

28. A method for noiseless switching between audio sources in a VOIP network, comprising:

(A) selecting one audio source;

(B) transmitting audio from the selected one audio source in an output audio stream of packets with synchronized header information on an egress audio channel to a destination device;

(C) selecting another audio source; and

(D) transmitting audio from the selected another audio source in an output audio stream of packets with synchronized header information on the same egress audio channel to the destination device.

29. The method of claim 28, wherein the another audio source comprises an internal audio source, and further comprising generating audio payloads for the output audio stream of packets prior to said transmitting step (B).

30. The method of claim 28, wherein the another audio source comprises an external audio source, and further comprising extracting audio payloads for the output audio stream of packets from IP packets generated at the external audio source prior to said transmitting step (B).

31. A method, comprising:

(A) transmitting audio from one audio source in an output audio stream of packets with synchronized header information on an egress audio channel to a destination device; and

(B) transmitting audio from another independent audio source in an output audio stream of packets with synchronized header information on the same egress audio channel to the destination device, whereby a user at the destination device perceives a noiseless switch over between transmitted audio from independent audio sources in a VOIP network.

32. A system, comprising:

(A) means for transmitting audio from one audio source in an output audio stream of packets with synchronized header information on an egress audio channel to a destination device; and

(B) means for transmitting audio from another independent audio source in an output audio stream of packets with synchronized header information on the same egress audio channel to the destination device, whereby a user at the destination device perceives a noiseless switch over between transmitted audio from independent audio sources in a VOIP network.